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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,766	11/25/2003	Marco Viti	856063.749	4188

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EXAMINER

HORN, ROBERT WAYNE

ART UNIT	PAPER NUMBER
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2837

DATE MAILED: 11/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/721,766	<b>Applicant(s)</b> VITI, MARCO	
	<b>Examiner</b> Robert W. Horn	<b>Art Unit</b> 2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 21 August 2006.
- 2a) ☒ This action is **FINAL**.      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-13, 15-16, 18-22 and 25-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-13, 15, 16, 18-22, 25-29, 34 and 35 is/are allowed.
- 6) ☒ Claim(s) 30 and 32 is/are rejected.
- 7) ☒ Claim(s) 31 and 33 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

The examiner acknowledges amendments dated 8/21/2006. The amendments are proper in that no new material has been added to the application. With the amendments, claims 1-12 have been amended, claims 14, 17 and 23-24 have been cancelled, and claims 25-35 have been added.

### ***Response to Arguments***

Applicant's arguments, see remarks, filed 8/21/2006, with respect to claim 1, now amended to include a limitation from claim 2, have been fully considered and are persuasive. The rejection of claim 1 has been withdrawn.

The applicant has argued with respect to new 30, based on the limitations of claim 8, that Cohen does not show the limitation "varying a counting frequency of the counter during various driving phases during various phases of the motor" and suggests that Cohen does not really mean that his invention varies the counting frequency as described in column 3, line 21. The examiner believes that the citation must be taken at face value, and cannot be reinterpreted by what is stated elsewhere in the patent. The examiner points to points to figure 4, items 142, 152, wherein is listed the instructions, "Updated software timer interrupt, and Adjust interrupt interval according to some control function," steps that could affect the counting frequency.

The applicant has argued with respect to new claim 32, based on the limitations of claim 9, that Cohen does not show the limitation "using a value assumed by the counter at the end of each counting window in formulas to estimate an instantaneous

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position of the rotor." The examiner respectfully disagrees. The examiner points to the phrase "means responsive to the counter means ... for synchronizing the field coil and the rotor." The examiner contends it is necessary to estimate an instantaneous position of the rotor, in order to perform the function of synchronizing as described.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 30 and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Cohen et al. (U.S. Patent 5,672,948).

Regarding claim 30, Cohen et al. discloses a method for detecting the angular position of a brushless electric motor, comprising:

detecting a polarity signal of a back electromotive force from a winding of the motor using a detection circuit (back EMF commutation state, abstract; column 6, lines 2-15);

using a bi-directional counter to count a difference in residence time of logic states '0' and '1' at an output of said detection circuitry during counting windows (figure 3A, Up/Down Counter, up on '0', down on '1', count 110 is the difference in residence time, column 6, lines 11-14); and

varying a counting frequency of the counter during various driving phases of the motor (column 3, line 21).

Regarding claim 32, Cohen et al. teaches a method for detecting the angular position of a brushless electric motor, comprising:

detecting a polarity signal of a back electromotive force from a winding of the motor using a detection circuit (back EMF commutation state, abstract; column 6, lines 2-15);

using a bi-directional counter to count a difference in residence time of logic states '0' and '1' at an output of said detection circuitry during each of a succession of counting windows (figure 3A, Up/Down Counter, up on '0', down on '1', count 110 is the difference in residence time, column 6, lines 11-14); and

using a value assumed by the counter at an end of each counting window in formulas to estimate an instantaneous position of the rotor, a period between two zero-crossings, and a speed of rotation (column 8, lines 16-35), and a speed of rotation (column 3, lines 28-33, speed column, 2, lines 55-57, column 5, lines 11-13). The means responsive to counter means for ascertaining, for ascertaining the final count (period), for adjusting the frequency of initiation of the commutation states (speed) when a non-zero count is ascertained for synchronizing the field coil and rotor (instantaneous position), disclosed by Cohen et al. is general enough to read on the language of claim 32.

#### ***Allowable Subject Matter***

Claims 31 and 33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 1-13, 15-16, 18-22, 25-29, and 34-35 allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Claim 1 is allowable over prior art for all the method steps, but especially the step: enabling the bi-directional counter around an expected zero-crossing of said back electromotive force with a counting window having an arbitrary duration. Claims 2-12 are allowable as dependent on claim 1.

The basis for allowability for claims 13, 15-16, and 18-22 were made of record in previous office actions. Claims 25 and 26 are allowable as dependent on claim 21.

Claim 27 is allowable over prior art for all the method steps, but especially the step: zeroing the counter at a start of each counting window, or at an arbitrary moment before such a time period. Claims 28 and 29 are allowable as dependent on claim 27.

Claim 34 is allowable over prior art for all the method steps, but especially the step:

computing a period between two zero-crossings according to the algorithm

$$\text{Period}(n) = \text{Period}(n-1) + K1 * \Delta(n-1)$$

where:

"Period(n-1)" results from a calculation carried out at an end of a previous window,

Delta is the calculation carried out at the end of the previous window and is a filtered value of position information of a real zero-crossing with respect to the expected zero crossing at the base;

"Period(n)" is the period which separates one zero crossing from a previous zero-crossing calculated at the end of a previous counting window; and

K1 and K2 are generic parameters whose value can be established according to filtering requirements.

Claim 35 is allowable as dependent on claim 34.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert W. Horn whose telephone number is 571-272-8591. The examiner can normally be reached on Monday-Friday 7:00-3:30 EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lincoln D. Donovan can be reached on 571-272-2800, ext 33. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

rwh  
October 24, 2006

  
LINCOLN DONOVAN  
SUPERVISORY PATENT EXAMINER